

Claims

What is claimed is:

- 1 1. A method of detecting a failure in a transmission medium of a data
2 communications network link, comprising:
3 sending a first set of data, in conjunction with a first source identifier, from a
4 first network access device to a second network access device via a first transmission
5 medium of a data communications link;
6 receiving at said first network access device, via said first transmission medium
7 of said data communications link, a second set of data in conjunction with a second
8 source identifier; and,
9 determining from said second source identifier that a transmission failure has
10 occurred in said first transmission medium of said data communications link.
- 1 2. The method of claim 1 wherein said step of determining comprises
2 determining that said second source identifier does not equal a pre-specified value.
- 1 3. The method of claim 1 wherein said step of determining comprises
2 determining that said second source identifier equals said first source identifier.
- 1 4. The method of claim 1 further comprising:
2 sending a second set of data in conjunction with said second source identifier
3 from a second network access device to said first network access device via a first
4 transmission medium of a data communications link.

1 5. The method of claim 1 further comprising:
2 deactivating said first transmission medium of said data communications link
3 for the sending of data and activating a second transmission medium of said data
4 communications link.

1 6. The method of claim 1 wherein said data is transmitted via said first
2 transmission medium as a plurality of data packets, wherein each of said plurality of
3 data packets comprises a data portion and a header portion.

1 7. The method of claim 6 wherein said source identifier is carried in a
2 portion of said header of said data packet.

1 8. The method of claim 7 wherein said source identifier comprises a
2 plurality of byte.

1 9. The method of claim 8 wherein said data is transmitted as a plurality
2 of SONET packets.

1 10. The method of claim 9 wherein said source identifier is transmitted as
2 a component of the c2 byte of the header portion of each of said data packets.

1 11. The method of claim 1 wherein the first network access device
2 comprises a first interface component coupled with said first transmission medium of
3 said data communications link, and a second interface component coupled with a
4 second transmission medium of said data communications link.

1 12. The method of claim 11 further comprising the steps, following said step
2 of determining of
3 deactivating said first interface component; and,
4 activating said second interface component.

1 13. The method of claim 11 wherein said first and second interface
2 components are optical interconnect devices, and said first and second transmission
3 mediums are optical fibers.

1 14. A method of detecting a failure in a fiber optic medium of a SONET
2 communications link in a data communications network, comprising:
3 sending data from a first network access device to a second network access
4 device, in conjunction with a first source identifier, via a first fiber optic medium of the
5 SONET communications link;
6 receiving at said first network access device, via said first fiber optic medium
7 of said data communications link, a second set of data in conjunction with a second
8 source identifier; and,
9 determining from said second source identifier that a transmission failure has
10 occurred in said first transmission medium of said data communications link.

1 15. The method of claim 14 wherein said step of determining comprises
2 determining that said second source identifier is not equal to a pre-specified value.

1 16. The method of claim 14 wherein said step of determining comprises
2 determining that said second source identifier is equal to said first source identifier.

1 17. The method of claim 14 further comprising the steps, following said step
2 of determining of:

3 deactivating said first fiber optic medium; and,
 activating said fiber optic medium.

1 18. A method for providing failover protection in a data communication link
2 having a plurality of transmission media, comprising:

3 sending data from the first device to the second device, in conjunction with a
4 first source identifier, via a first transmission medium;

5 detecting a source identifier in all data received by the first device via said first
6 transmission medium; and,

7 determining when the source identifier of data received by the first device
8 equals the source identifier of data sent by the first device, that a failure has occurred
9 in the first transmission medium and

10 deactivating said first transmission medium,

11 activating a second transmission medium.

1 19. An apparatus for providing failover protection in a bidirectional data
2 communication network, comprising:

3 a first communications device, for receiving data and transmitting data with an
4 identifying source identifier;

5 a second communications device for receiving data;

6 a first communications interface, coupled with said first communications
7 device, for the relay of bidirectional data communication, which is by default active;

8 a second communications interface, coupled with said first communications
9 device for the relay of bidirectional data communication, which is by default inactive;

10 a detector coupled with said first communications device for determining the
11 source identifier of incoming data, and determine the source of the data, thus
12 determining that the first communications interface has failed;

13 a controller coupled with said first communications device for setting the first
14 communications interface as inactive and the second communications interface as
15 active, in response to said detector determining that the first communications interface
16 has failed.

1 20. The apparatus of claim 19 wherein said step of determining comprises
2 determining that said second source identifier does not equal a pre-specified value.

1 21. The apparatus of claim 19 wherein said step of determining comprises
2 determining that said source identifier equals a source identifier in data sent by the
3 second communications device.

1 22. The apparatus of claim 19 wherein said data is transmitted via said first
2 transmission medium as a plurality of data packets, wherein each of said plurality of
3 data packets comprises a data portion and a header portion.

1 23. The apparatus of claim 22 wherein said source identifier is carried in a
2 portion of said header of said data packet.

1 24. The apparatus of claim 23 wherein said source identifier comprises a
2 plurality of byte.

1 25. The apparatus of claim 24 wherein said data is transmitted as a plurality
2 of SONET packets.

1 26. The apparatus of claim 25 wherein said source identifier is transmitted
2 as a component of the c2 byte of the header portion of each of said data packets.

1 27. The apparatus of claim 19 wherein the first communications device
2 comprises a first interface component coupled with a first transmission medium of said
3 communications interface, and a second interface component coupled with a second
4 transmission medium of said communications device.

1 28. The apparatus of claim 27 further comprising the steps, following said
2 step of determining of
3 deactivating said first interface component; and,
4 activating said second interface component.

1 29. The apparatus of claim 27 wherein said first and second interface
2 components are optical interconnect devices, and said first and second transmission
3 mediums are optical fibers.

1 30. A method for providing failover protection in a bidirectional data
2 communication network, comprising:

3 activating a first communications link for transfer of data from a first device to
4 a second device;

5 sending data from the first device to the second device, together with a first
6 source identifier;

7 sending data from the second device to the first device, together with a second
8 source identifier;

9 detecting at the first device the source identifier of all data received by the first
10 device;

11 detecting at the second device the source identifier of all data received by the
12 second device; and,

13 determining, either

14 when the source identifier of data received by the first device
15 equals the source identifier of data sent by the first device, or

16 when the source identifier of data received by the second device equals
17 the source identifier of data sent by the second device,

18 that a failure has occurred in the first communications link, and

19 deactivating the first communications link,

20 activating a second communications link.